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the resultant equals the volume enclosed by the loading

$$F_R = \int p dx \cdot y$$

$$= \int_0^5 \left(\frac{240}{x+1} + 340 \right) \cdot 6 dx$$

$$= -(6)240 \left[\ln(x+1) \right]_0^5 + 6(340) \left[x \right]_0^5$$

$$= -2317.59 + 10200$$

$$= ~~12882.41~~$$

$$= 7882.41 \text{ N}$$

$$\bar{x} = \frac{\int x dv}{\int dv}$$

, we just get $\int dv$ from above

$$\int x dv = \int_0^5 x \left(\frac{240}{x+1} + 340 \right) \cdot 6 dx$$

Students complete integration and get \bar{x}
Repeat to get \bar{y} .